

App. No. 10/676,136
Office Action Dated January 17, 2006

REMARKS

Favorable reconsideration of this application is requested in view of the above amendments and the following remarks. Claims 1 and 13-15 are hereby amended. Claim 5 is canceled without prejudice or disclaimer.

Amendment of claim 1 is supported by the subject matter of claim 5. Amendments of claims 13 and 14 are supported by Figure 4. Amendment of claim 15 is supported by Figure 5.

Claims 1-15 were rejected as being indefinite. Claims 1 and 13-15 are amended to address the concerns of the Examiner. Favorable reconsideration of claims 1-4 and 6-15 is requested.

Claims 1-3, 5, 6, and 9-15 were rejected as being unpatentable over Tu (US 6,521,881) in view of Tanner (US 4,631,400). Applicants traverse this rejection. The combination of Tu and Tanner does not teach a solid state imaging device including an imaging semiconductor chip comprising a photoelectric converter for converting light into an electric signal and an amplifier for amplifying the electric signal generated by the photoelectric converter, wherein all transistors thereof are formed of the same conductivity type, as required by claim 1. The rejection concedes Tu as not disclosing an imaging semiconductor chip in which all transistors are formed of the same conductivity type. While Tanner teaches buffers (26, 27, 28, the rejection equates to the claimed amplifier) that may be implemented in an optical motion detector nMOS integrated circuit chip, Tanner does not suggest that the buffers (26, 27, 28) amplify an electric signal converted by the photoelectric converter, as required by claim 1. The nMOS integrated circuit chip taught by Tanner is for an optical mouse and therefore does not output an image signal, but rather outputs a signal indicating the direction of movement based on the image signal. The buffers (26, 27, 28) amplify and output the signals indicating the direction of movement.

In contrast, the solid state imaging device of claim 1 provides an imaging semiconductor chip including a photoelectric converter and an amplifier for amplifying the electric signal

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converted by the photoelectric converter. With the claimed configuration, the image signal supplied from the imaging semiconductor chip to the image processing semiconductor chip has a gain of at least a predetermined level, thereby avoiding being affected by noise from a through current.

Claim 1 requires that the imaging semiconductor chip is comprised of transistors of the same conductivity type. Thus, generation of noise due to a through current can be prevented. Claim 1 further requires that the image processing semiconductor chip is comprised of CMOS transistors. A CMOS composition is ideal for miniaturization. Claim 1 allows that a process suitable for the imaging semiconductor chip can differ from the process suitable for the image processing semiconductor chip (CMOS). In contrast, both chips (12, 16) taught by Tu are comprised of CMOS transistors, and the entire optical mouse (10) taught by Tanner is comprised of a single nMOS chip.

Further, one skilled in the art would not be motivated to combine the image sensor taught by Tu with the optical motion detector taught by Tanner. Both chips taught by Tu are comprised of CMOS transistors, and the entire optical motion detector taught by Tanner is comprised of a single nMOS chip. The Examiner contends that one would be motivated to combine Tu with Tanner to obtain a more compact chip. Applicants disagree with this view. Since CMOS transistors (as used by Tu) are known to be miniaturized easily, one would already consider the image sensor taught by Tu to be relatively compact. Also, the entire optical motion detector (optical mouse) taught by Tanner is comprised of a single nMOS chip that outputs a signal indicating the direction of movement. There would be no motivation to add a CMOS chip to the single nMOS chip since no added functionality is needed.

Favorable reconsideration of claims 1-3, 6, and 9-15 is requested.

Claims 7 and 8 were rejected as being unpatentable over Tu, in view of Tanner, and further in view of Tago (US 6,844,619). Applicants traverse this rejection. Claims 7 and 8 should be considered allowable for at least the same reasons as claim 1, from which they depend. Applicants are not conceding the correctness of the rejection as applied to the rejected claims. Favorable reconsideration of claims 7 and 8 is requested.

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Claims 1-15 were rejected for obviousness-type double patenting as being unpatentable over copending application 10/658,700. A terminal disclaimer is filed herewith, rendering the rejection moot.

In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions regarding this communication can be directed to the undersigned attorney, Douglas P. Mueller, Reg. No. 30,300, at (612)455-3804.

Respectfully Submitted,



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